

Introduction

Why a survey?

Why carry out a detailed survey of professional engineers; a survey which will make available more information than on any other profession in Britain? The answer is that the engineer plays a central part in our prosperity and well-being today. He is both a creator and a catalyst in the important process of technological change; and he is closely concerned with our place in a world where engineering products account for a high proportion of export trade. He is directly affected by changing technologies and techniques, by new materials, new processes and new products. Exciting concepts, such as micro-electronics, computer-aided design, computer-controlled manufacturing processes, revolutionary transportation systems, and space and ocean technologies, have come into view. Bio-engineering and other new fields are opening up. Older industries are being transformed; and organizations are now being seen as complex dynamic systems involving various sorts of interaction of man and machine. The engineer is in the thick of all this, both as technologist and as manager, and although the annual output of engineers from the universities and other sources has risen by 50 per cent over the past decade, there are still significant shortages of professional engineers in the economy.

It is essential for the future prosperity of Britain that talented youngsters are attracted to engineering as a career. Undoubtedly the attitude of society to engineers has a profound influence on the career choices of young people at school, and there are indications that the importance of the engineer today is not reflected in his relative standing among the professions and in society.

The Council of Engineering Institutions and the Ministry of Technology decided that more facts were needed about the engineer, his background and his daily work. This information will not supply all that is needed for considered judgments about the engineer, as we lack similar profiles of other professions for comparison. Nevertheless, it is an important first step, a pioneering effort which may well set the example for surveys of other professions. The Federation of European National Associations of Engineers (FEANE) has already recommended a survey on similar lines to other member countries.

What is an engineer?

We have mentioned above some of the fields pertinent to the engineer's talents. More formally, he has been described as a man who applies resources of men, money and materials to mould the physical environment and produce the machinery and goods required by society. All methods of approach are of importance to him provided they lead to the desired objective. He has always to be a planner, and will frequently be called upon to exercise managerial and perhaps financial skills. The developing use of computers will reduce the tedious elements of calculations and trial and error, and will extend his faculties, particularly in design and management. Thus, in an age of increasing specialization, the professional engineer is the synthesizer par excellence, the modern creative man.

The Council of Engineering Institutions

Engineers have been organized professionally in separate institutions concerned with a particular engineering specialism, although the need for closer links between the principal institutions had been recognized for a long time. A federal body was formed in 1962 which led to the establishment of the Council of Engineering Institutions under Royal Charter in 1965. The object and aims of the Council are:

'To promote and co-ordinate in the public interest the development of the science, art and practice of engineering, and for that purpose:

- (i) to establish, uphold and advance the standards of qualification, competence and conduct of professional engineers;
- (ii) to advance the aims and objectives of its members so far as they relate to the advancement of the science, art or practice of engineering;
- (iii) to foster relations with the Government, with national and international bodies and with the public; and to co-operate with other bodies at all levels of technical and professional competence, whose objects and purposes may be related to those of the Council;
- (iv) to foster co-operation with universities and other educational institutions;
- (v) to foster co-operation between its members on matters pertaining to the science, art or practice of engineering.'

The Charter also provides that the style or title of Chartered Engineer and the initials 'C.Eng.' may be used by fully qualified members of professional institutions. The constituent institutions are listed at Table 18, together with figures of membership.

Education and training

The engineer requires a knowledge of mathematics, basic science, and the technologies appropriate to his chosen field of work. As a synthesizer, and a solver of problems, his ideal education would be a broad one, taking in many different practical applications of materials and technologies. The qualifications required of a professional engineer were determined in the past by his own professional institution. With the greater integration of the profession within the Council of Engineering Institutions, there will in future be common standards of education and training set for qualification as a Chartered Engineer. The qualification for corporate membership of individual institutions has varied, but generally has included:

- e minimum age;
- an academic qualification based on the institution's own examinations or exemption from them, which may be below or at university degree level; some institutions have had large numbers qualified through the Higher National Certificate;
- a period of training and responsible professional experience, the requirements for which have varied widely. Some institutions required additional examinations of a professional nature.

With the granting of a Royal Charter to the Council of Engineering Institutions (1968) the minimum requirements have become (subject to certain transitional arrangements):

- e minimum age of 25;
- an academic qualification at first-degree level in engineering or an appropriate science, or the equivalent CEI Common Examination which will come into operation in 1968;
- a period of training and professional experience of not less than three years in total. Institutions may continue to call for certain professional tests by examination, interview or other means.

There are various schools of thought about the best professional training of the university graduate who will increasingly predominate in the ranks of professional engineers in the years ahead. One recent solution, which is attracting widespread interest in industry, was contained in the report of a Working Group of the Committee on Manpower Resources for Science and Technology which studied the education and training requirements for the electrical and mechanical manufacturing industries (The Bosworth Report⁶). The Report thought that training should attempt two tasks:

'First, it must achieve the most efficient conversion of

the graduates into an effective industrial technologist making the best use of his educational background and maintaining his interest and enthusiasm; second, it must succeed in attracting a higher proportion of the ablest graduates into industrial employment. A successful solution must embody the conviction that design and production offer challenges and satisfaction every whit as great as those of research and development—for scientists as much as for engineers and technologists.'

This approach has been widely endorsed both in industry and by the engineering profession, and action has already been taken to implement some of the main recommendations of the Report.

The survey itself

The survey itself was aimed at a cross-section of professional engineers in membership of the institutions which were constituent members of the Council of Engineering Institutions. In order to obtain a picture of the younger members of the profession, the survey included graduate members of the institutions as well as Chartered Engineers. The survey was a sample of 25 000 engineers (approximately 15 per cent of total membership), and there was a response rate of 86 per cent. The questionnaire, which is reproduced at pages 31-38, contained sections covering age, qualifications and training, employment, income, and levels of responsibility. The survey sought about as much information as could reasonably be required of any voluntary participant. It produced considerable information, all of which has been punched on cards and can be drawn from the computer and cross-classified within the limits of confidence and statistical reliability as occasion requires. For the purposes of this first report, only the main results have been tabulated and interpreted, although some of the more important detailed information is given in tables in the Appendices.

⁶Education and Training Requirements for the Electrical and Mechanical Manufacturing Industries—HMSO, 1969

The main results charts and summary tables

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Age distribution of engineers

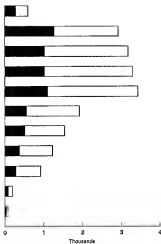


Table 1	Sample number	Per cent
All engineers	19 428	
Engineers stating age	18 296	100.0
Under 25	566	2.9
25 - 29	2 932	15.7
30 - 34	3 193	16.8
35 - 39	3 306	17.7
40 - 44	3 435	17.8
45 - 49	1 947	10.1
50 - 54	1 544	8.0
55 - 59	1 227	6.4
60 - 64	804	4.7
65 - 69	204	1.1
70 and over	48	0.2

About two-thirds of engineers were under 45; about one-third were in the age-group 35-44. This latter group represents a distinct bulge as compared with the 10-year age group, 45-54, ahead of them.

The younger age group 25-34 (32 per cent) does not give a complete picture of younger engineers in the country. Some university graduates do not join an institution until some time after obtaining their degree.

● See also pages 18, 19, 22-27

Type of employer



Table 2	Sample number	Per cent
All engineers	18 428	
Engineers stating employer	18 280	100.0
Self-employed	524	2.7
Employed by—		
Industrial or commercial company or private firm	10 238	53.4
Nationalized industry or public corporation	2 734	14.2
The GPO	174	0.9
Central Government	1 179	6.7
The Armed Forces	429	2.2
The UK Atomic Energy Authority	326	1.7
Local authority, including colleges and schools	2 743	14.2
University or college of advanced technology	466	2.4
Other employer	418	2.2

The overwhelming majority of engineers are employees. Less than 3 per cent are self-employed.

More than half (53 per cent) of engineers are employed by private industry and commerce. Smaller but still important employers are the nationalized industries (14 per cent), local authorities (14 per cent), and Central Government including the Armed Forces and the UKAEA (10 per cent).

Type of work

The distribution of engineers by type of work is shown in the chart below. The shaded areas represent those who stated that they held an administrative or managerial position.

General technical administration (27 per cent), claims substantially more engineers than any other type of work. But if design and research and development are taken together (as

in practice they often must be) then this combined group would take the lead from general technical administration with 31 per cent.

More than half of the engineers surveyed stated that they held administrative or managerial positions. Non-management posts are concentrated in design, research and teaching.

General technical administration

Design

Research and development

Production, instrumentation and control

Commercial and consultancy

Construction

Teaching

Other

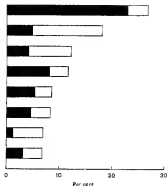


Table 3	Sample number		In managerial positions	In other positions
All engineers	19 428		10 887	8541
Engineers stating type of work	18 870	%	10 422	8448
General technical administration	5 087	26.7	4 347	720
Design	3 438	18.1	847	2491
Research and development	2 373	12.6	817	1556
Production	1 780	9.4	1 369	411
Instrumentation and control	426	2.3	188	272
Commercial	1 064	5.6	784	300
Consultancy	583	3.1	300	283
Construction, installation	1 801	9.4	893	708
Teaching	1 347	7.1	248	1102
Other engineering work	971	5.1	384	587
Not engineering work	328	1.7	210	118

Field of work

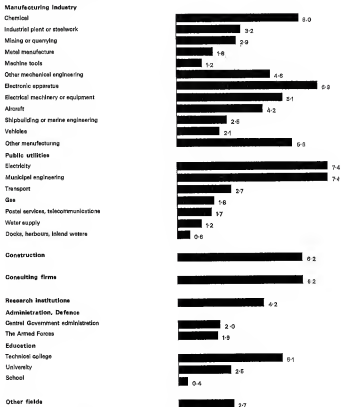
The chart below shows the distribution of engineers according to their field of work, using wide groupings. The more detailed breakdown shown opposite is based on the Standard Industrial Classification.



Table 4

	Sample number	Per cent
All engineers	19 428	
Engineers stating field	19 325	100.0
Manufacturing industry	8 501	45.1
Public utilities	4 307	22.8
Construction	1 182	6.2
Consulting firms	1 188	6.2
Research institutions	513	4.2
Central Government administration	382	2.0
The Armed Forces	375	1.9
Education	1 540	8.0
Other fields	526	2.7

Percentage of all engineers who stated field of work



Distribution of incomes

The following charts show the distribution of gross earned incomes, for the financial year 1988/89, in a variety of ways: a distribution at £200 intervals; medians, quartiles and deciles by age; and finally cumulative charts showing numbers and percentages above certain income levels.

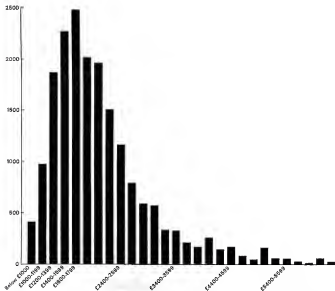
Earnings at various levels were as follows:

90% earned at least £1260	25% earned at least £2600
75% earned at least £1830	10% earned at least £3600
50% earned at least £1950	

Two per cent of engineers in the sample earned £8000 and above, ranging up to £17 400. The great majority of this group were in industry or were self-employed.

Distribution of incomes at £200 intervals

Number
of
incomes



Distribution of incomes by age (median, quartile and decile incomes)

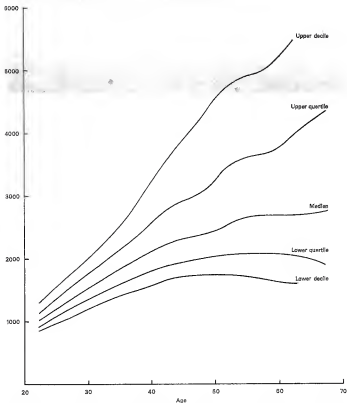


Table 5

	Lower decile	Lower quartile	Median	Upper quartile	Upper decile
	£	£	£	£	£
All ages	1266	1632	1949	2530	3497
Under 25	842	906	1012	1148	1296
25 — 29	1064	1196	1345	1634	1734
30 — 34	1281	1443	1648	1904	2136
35 — 39	1474	1680	1886	2321	2789
40 — 44	1638	1881	2237	2767	3530
45 — 49	1706	2003	2372	3032	4173
50 — 54	1722	2080	2573	3507	4800
55 — 59	1691	2093	2689	3879	5023
60 — 64	1696	2077	2688	4009	5637
65 — 69	*	1918	2750	4386	*

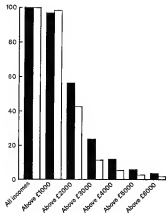
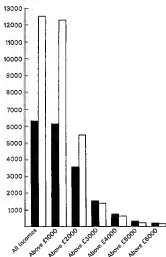
*Numbers in these groups are too small to justify calculation of deciles.

Distribution of incomes of university graduates and non-graduates at £1000 intervals

The table below shows the numbers and percentages of engineers with incomes at different income levels. The cumulative charts opposite compare the incomes of university graduates and non-graduates—Chart A showing numbers and Chart B percentages.

Table 6

	Distribution		Cumulative	
	Number	Per cent	Number	Per cent
UNIVERSITY GRADUATES				
All engineers	5 585			
Engineers stating incomes	6 381	100.0		
Above £0000	206	3.2	206	3.2
£0000 — 5999	164	2.6	370	5.8
£4000 — 4999	301	4.0	761	11.6
£3000 — 3999	709	12.1	1 620	23.9
£2000 — 2999	2 096	39.0	3 616	56.9
£1000 — 1999	2 595	40.3	6 172	87.2
Below £1000	179	2.8	6 381	100.0
NON-GRADUATES				
All engineers	12 683			
Engineers stating incomes	12 581	100.0		
Above £6000	172	1.4	172	1.4
£5000 — 5999	142	1.1	314	2.5
£4000 — 4999	302	2.4	616	4.9
£3000 — 3999	814	6.5	1 430	11.4
£2000 — 2999	3 908	31.0	5 338	42.4
£1000 — 1999	7 022	55.8	12 365	98.2
Below £1000	226	1.8	12 581	100.0



Levels of responsibility

The guide to levels of engineering responsibility is reproduced at the foot of these pages.

The guidance given to engineers on the questionnaire was as follows:

'The previous questions have all been concerned with matters of fact. In this Part we are concerned with a matter of judgement.

The table has been drawn up as a guide to six levels of responsibility, and it is intended as a guide, not as a precise definition.

No guide can hope to fit exactly over the wide range of activities of the various kinds of professional engineering, so

using the guide is a matter of deciding which level, taken as a whole, is the best fit for you'.

Up to 60 per cent of the engineers (excluding teachers) would be regarded as managers or executives (in terms of status) under these classifications even though not all of those concerned were primarily engaged in management. This ratio may be compared with the 58 per cent of engineers (excluding teachers) who stated that they were in managerial positions excluding teaching (Table 3).

About half of the engineers at Level A (technical functions) were younger engineers who had recently qualified.

Guide to levels of engineering responsibility

Level of Responsibility	Level A	Level B	Level C
Duties	Preparation of simple plans, designs, calculations, estimating, standards, drawings and other specifications. Routine technical work.	Uses standard engineering techniques for solving problems. Assists more senior engineers with calculations, testing, analysis, design or computation.	Responsible and varied engineering assignments requiring familiarity with a broad field of engineering knowledge. Participates in planning to achieve broad objectives.
Recommendations, decisions and commitments	Routine decisions with ample precedent or with clearly defined procedures as guidance.	Recommendations limited to solution of problem rather than end results. Decisions normally within established guide lines.	Makes independent studies, analyses, judgements and conclusions. Difficult, complex or unusual matters or decisions are usually referred to a higher authority.
Supervision received	Close supervision. Work reviewed for accuracy and adequacy and for conformity with prescribed procedures.	Detailed oral or written instructions on methods and procedures. Results reviewed and technical guidance available.	Work not usually supervised in detail though technical guidance available on unusual or complex problems.
Leadership, authority and/or supervision exercised	May assign and check work of technicians.	May give technical guidance to junior engineers or technicians on a common project.	May give technical guidance to other engineers or technicians assigned to work on a common project. Not normally having continuous responsibility for other engineers.

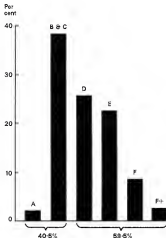


Table 7

	Sample number	Per cent
All engineers (excluding teachers)	17 797	100.0
Analysis by level		
A Technical functions	385	2.2
B } Engineering functions	1 235	6.9
C }	5 577	31.3
D Junior management	4 583	25.8
E Senior management	3 971	22.3
F Top management	1 553	8.7
Beyond F management	467	2.7

Level D

First level of direct and sustained supervision of other professional engineers or full specialization. Application of mature engineering knowledge and conducting projects with scope for independent accomplishment.

Recommendations generally reviewed for soundness of judgement but accepted for technical accuracy and practicability.

Work assigned in terms of objectives, relative priorities and critical areas relevant to other projects.

Assigns and outlines work. Advises on technical problems, reviews work of others for technical accuracy. May have continuous responsibility for other engineers and technicians.

Level E

Usually requires knowledge of more than one field of engineering. Long and short-term planning of projects. Makes independent decisions on work programmes. Exercises ingenuity and originality in devising practical and economical solutions to problems. May supervise large groups of professional and technician staff or a small group of highly specialized professional staff.

Makes responsible decisions not usually subject to technical review except those involving large expenditure or long-term objectives. Takes action to implement assigned projects.

Work assigned only in terms of broad objectives and is only reviewed for policy, soundness of approach and general effectiveness.

Co-ordinates work programmes and directs use of equipment and materials. Generally makes recommendations on the selection, discipline and remuneration of staff.

Level F

Exercises administrative responsibility for several groups on interrelated problems. Senior engineering consultant of recognized standing in his field of engineering. Participates in determining major engineering policy.

Makes responsible decisions on all matters including large expenditure and/or implementation of major programmes subject only to overall policy and financial control.

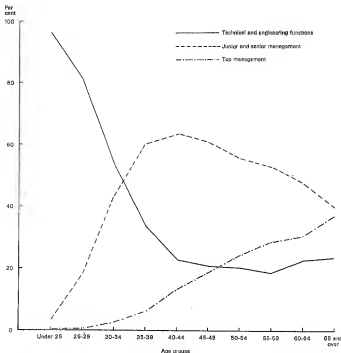
Receives administrative direction based on general policy and objectives. Work reviewed only to ensure conformity with policy and co-ordination with other functions.

Reviews and evaluates engineering work. Co-ordinates to attain overall programme objectives. As an administrator makes decisions on selection, discipline and remuneration of staff.

Analysis by age group

The chart below shows the proportion of engineers in each age group who stated their level of responsibility as A, B and C, (technical or engineering functions); D and E, (junior or

senior management); and F or beyond F, (top management). About 20 per cent of engineers in each age group above 40 stated that they were in technical and engineering functions. The proportion in top management rose steadily with age.



Appendices

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Table 6
ALL ENGINEERS IN SAMPLE
Analysis by age and type of employer

	TOTALS	Age groups										Age not stated	
		Under											
		25	26-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70 and over	
ALL ENGINEERS	19 426	566	2022	3183	3396	3435	1947	1544	1227	504	204	48	132
	%	2.9	10.1	16.5	17.1	17.8	10.1	8.0	6.4	4.7	1.1	0.2	
Self-employed	624	3	21	29	67	93	62	91	67	58	42	26	6
Employed by—													
Central Government	1 176	8	89	110	142	243	204	163	151	67	12	2	8
The Armed Forces	429	7	66	82	75	91	67	30	16	2	—	—	—
The GPO	174	4	12	19	24	27	23	26	23	6	—	—	—
Local authority, including colleges and schools	2 743	44	321	424	569	477	302	244	227	159	19	1	16
Nationalised industry or public corporation	2 734	81	411	425	447	483	268	231	150	144	21	2	31
The UK Atomic Energy Authority	326	2	12	47	76	94	53	27	15	—	—	—	—
University or college of advanced technology	465	17	89	78	106	71	60	27	27	11	6	—	—
Industrial or commercial company or private firm	10 258	382	1873	1698	1781	1730	896	877	462	417	91	15	56
Any other employer	416	10	54	65	62	63	41	37	47	29	7	—	3
Employer not stated	148	3	35	15	16	13	11	11	10	11	6	3	7

Table 9

ALL ENGINEERS IN SAMPLE

Analysis by age and type of work performed

	Age groups											Age not stated
	Under											
	25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70 and over	
TOTALS												
ALL ENGINEERS	19 428	2932	3193	3306	3435	1947	1544	1227	904	204	48	132
In administrative or managerial positions	%	2.9	15.1	19.5	17.1	10.1	6.0	6.4	4.7	1.1	0.2	
Not in administrative or managerial positions—Total	8 548	481	2169	1816	1087	553	368	243	215	56	17	32
General technical administration	720	20	127	124	121	70	48	38	31	5	3	1
Production	411	41	143	77	50	35	20	13	9	1	—	2
Inspection and control	272	22	84	66	30	25	7	13	7	2	—	—
Construction, installation	768	62	204	166	105	70	45	21	19	6	—	1
Research and development	1 556	111	466	348	263	175	85	54	26	23	8	4
Design	2 431	157	731	558	458	283	116	66	40	36	5	9
Teaching	1 102	4	102	267	222	128	71	45	43	8	—	11
Commercial	300	16	56	62	49	41	17	23	12	7	2	2
Consultancy, if not covered in one of the other categories	283	6	45	41	43	47	20	17	15	20	14	9
Other engineering occupation	587	39	135	125	100	78	43	23	13	16	7	1
Not engineering occupation	118	3	34	17	17	10	11	11	10	5	—	—
Type of work not stated	163	9	17	37	25	28	15	12	13	10	8	4

Table 10

ALL ENGINEERS IN SAMPLE

Analysis by type of work performed and field of work

	TOTALS	General technical admin.	Production	Instru- menta- tion and control	Con- struction and instal- lation	Design	Teaching	Com- muni- cation	Consult- ancy	Other engi- neering	Not engi- neering	Type of work not stated	
ALL ENGINEERS	19 428	8087	1790	428	1601	2373	3438	1347	1054	583	971	323	468
	%	26.7	9.4	2.3	8.4	12.5	18.1	7.1	5.6	3.1	5.1	1.7	
Manufacturing Industry—Total	8 901	4851	1406	253	267	1420	1706	21	762	112	396	94	138
Mining or quarrying	551	141	293	6	20	30	21	1	14	10	31	7	19
Chemical or allied manufacture	1 126	60	297	148	44	85	144	2	87	22	57	26	14
Metal manufacture	267	118	72	4	20	28	41	—	35	2	28	3	7
Machine tools manufacture	229	70	44	4	2	19	52	3	25	3	7	—	
Industrial plant or equipment	828	32	165	11	49	86	153	2	64	7	29	2	6
Other mechanical engineering	882	46	255	13	21	91	204	3	91	10	47	6	17
Electrical machinery or equipment	904	51	187	52	18	127	208	—	201	9	22	5	19
Electronic or telecommunication apparatus	1 328	69	210	63	32	454	233	3	93	10	46	15	16
Shipbuilding or marine engineering	491	25	170	33	17	48	80	2	35	15	58	1	12
Aircraft or aero-engines manufacture	802	42	147	91	6	247	234	1	19	7	27	4	5
Vehicle manufacture	411	27	81	96	5	79	96	3	16	3	11	4	3
Other manufacturing industry	1 082	56	254	20	33	186	145	1	102	14	35	21	19
Construction—Building, civil engineering contracting	1 182	62	232	25	6	529	257	—	62	8	20	7	25

Table 10—continued

ALL ENGINEERS IN SAMPLE

Analysis by type of work performed and field of work

	TOTALS	%	General technical ability	Production	Instru- menta- tion and control	Com- muni- cation labo- ratory	Research and develop- ment	Design	Teaching	Com- muni- cation material	Other engineer- ing	Not engi- neering	Type of work not scored
Public utilities—Total	4397	22.9	1834	187	113	553	179	866	9	189	33	406	34
Gas production or distribution	343	1.6	112	94	10	38	14	20	1	33	1	3	0
Electricity generating or distribution	1429	7.4	516	71	84	263	62	182	—	69	8	165	3
Water supply	253	1.2	127	1	2	28	1	50	—	3	—	13	1
Transport (by rail, road, air, water)	527	2.7	228	12	7	22	42	53	4	29	10	98	10
Docks, harbours, inland waterways	108	0.6	65	1	—	15	2	18	—	1	2	9	2
Municipal engineering	1428	7.4	680	4	4	123	5	478	1	—	6	66	1
Postal services, telecommunications or broadcasting	331	1.7	112	4	6	58	47	25	3	4	4	51	11
Research—Research institution, association or station	613	4.2	102	18	29	11	515	109	1	3	6	3	3
Education—Total	1540	8.0	49	1	5	2	31	8	1275	—	3	4	42
University or college of advanced technology	480	2.5	11	1	5	—	79	4	323	—	2	4	16
Technical college or training college	930	5.1	37	—	—	2	2	2	898	—	1	—	12
School	70	0.4	1	—	—	—	—	—	54	—	—	—	—
Public administration and defense—Total	757	3.9	471	31	5	26	54	26	37	1	13	23	33
Central Government administration	352	2.0	231	21	2	20	24	27	2	1	11	13	17
The Armed Forces	375	1.9	240	10	3	6	30	9	35	—	2	10	16
Consulting firms	1199	6.2	152	20	8	103	16	479	—	9	360	11	18
Other fields	528	2.7	115	5	9	15	28	34	2	65	42	88	25
Field not stated	103		15	7	—	6	6	5	2	13	5	4	9

Table 11
ALL ENGINEERS IN SAMPLE
Analysis by age and field of work

	Age groups											Age not stated	
	Under												
	TOTALS	25	26-28	30-34	36-39	40-44	45-49	50-54	55-59	60-64	65-69		70 and over
ALL ENGINEERS	19 428	568	2822	3183	3306	3436	1947	1544	1227	304	204	48	132
	%	2.9	15.1	16.5	17.1	17.6	10.1	8.0	6.4	4.7	1.1	0.2	
Manufacturing industry	8 901	281	1482	1543	1523	1573	834	534	475	408	80	14	74
Construction	1 152	63	227	238	222	174	88	67	62	42	19	8	6
Public utilities	4 397	123	602	852	715	740	430	400	354	227	20	1	16
Research institution, association or station	813	4.2	10	88	131	130	171	110	87	45	17	5	1
Education	1 540	8.0	25	149	238	329	308	186	113	85	71	11	14
Central Government administration	382	2.0	—	7	17	30	87	67	65	71	30	5	2
Armed Forces	376	1.9	0	52	70	67	63	56	25	12	1	—	2
Consulting firms	1 189	6.2	46	207	187	190	193	111	75	65	81	31	18
Other work	520	2.7	12	58	71	67	85	61	63	51	40	21	3
Field not stated	103	—	—	10	8	14	23	13	8	7	7	3	5

Table 12

ALL ENGINEERS IN SAMPLE

Analysis by age and income group

	TOTALS	Age groups											Ages not stated
		Under											
		25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70 and over	
ALL ENGINEERS	19 428	686	2022	3193	3306	3435	1947	1644	1227	904	204	48	132
	%	2.9	16.1	16.5	17.1	17.6	10.1	8.0	6.4	4.7	1.1	0.2	
Below £1050	405	2.1	25.7	13	4	4	5	5	3	6	4	2	2
£1050—£1199	985	5.1	18.7	603	57	29	8	4	9	15	3	2	3
£1200—£1399	1 864	9.6	49	956	508	150	72	23	31	28	8	6	6
£1400—£1599	2 286	12.0	15	865	780	386	179	80	53	41	12	2	8
£1600—£1799	2 471	13.1	6	316	734	612	403	97	78	45	13	1	10
£1800—£1999	2 012	10.6	2	59	442	537	444	208	133	73	11	—	10
£2000—£2499	4 051	21.4	—	61	439	585	1007	396	274	176	26	5	23
£2500—£2999	1 848	10.3	1	7	308	507	345	269	190	134	24	3	21
£3000—£3999	1 683	8.4	1	4	33	387	285	280	233	169	22	4	20
£4000—£4999	683	3.6	—	—	10	41	123	115	129	95	26	3	10
£5000—£5999	306	1.6	—	—	2	16	57	48	60	41	14	1	2
£6000 and over	378	2.0	—	1	10	48	64	78	83	81	23	8	4
Income not stated	496	69	92	45	54	49	41	30	31	42	16	11	14
Lower decile	1256	£	£	£	£	£	£	£	£	£	£	£	*
Lower quartile	1532	842	1054	1281	1474	1638	1708	1722	1861	1596			
Median	1949	965	1195	1443	1689	1881	2003	2080	2093	2077	1650		
Upper quartile	2620	1012	1345	1648	1966	2237	2372	2573	2688	2688	2747		
Upper decile	3487	1148	1534	1904	2321	2787	3052	3507	3679	4009	4460		*

* Figures in these groups are too small to justify calculation of deciles.

Table 13

ENGINEERS IN SAMPLE WITH A UNIVERSITY DEGREE OR DIPLOMA IN TECHNOLOGY

Analysis by age and income group

	Age groups											Age not stated
	Under											
	25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70 and over	
TOTALS	268	1232	1009	1008	1133	674	497	368	282	72	16	50
ALL GRADUATE ENGINEERS												
	%											
Below £1000	179	2.8	8	2	2	—	1	—	1	1	1	—
£1000—1150	347	5.5	13	4	—	—	1	—	2	—	1	1
£1200—1325	489	7.7	83	18	1	1	1	2	2	1	2	2
£1400—1589	667	8.8	7	294	181	41	10	6	5	3	2	1
£1600—1759	598	9.4	1	188	237	94	52	17	11	7	8	—
£1800—1959	565	8.9	—	50	198	156	90	32	20	11	4	3
£2000—2439	1286	20.4	—	33	214	385	348	136	77	50	40	11
£2500—2999	798	12.6	—	5	49	151	203	117	103	69	43	8
£3000—3999	789	12.1	—	3	23	103	225	125	159	95	61	10
£4000—4999	381	6.0	—	—	6	27	80	68	76	83	42	14
£5000—6999	184	2.8	—	—	1	12	31	25	37	29	21	6
£8000 and over	206	3.2	—	—	—	6	38	35	48	35	42	7
Income not stated	214	53	62	13	10	18	12	8	12	13	8	2
Lower decile	1245	*	1049	1416	1674	1304	1980	2564	2106	2086	*	*
Lower quartile	1605	908	1203	1679	1915	2173	2238	2490	2850	2684	2182	*
Median	2147	1020	1367	1784	2206	2613	2847	3163	3383	3350	3183	*
Upper quartile	2948	1138	1587	2076	2591	3370	3786	4244	4532	4782	4542	*
Upper decile	4187	*	1762	2298	3258	4202	5087	5955	6880	7444	*	*

*Numbers in these groups are too small to justify calculation of deciles.

Table 14
ENGINEERS IN SAMPLE WITHOUT A UNIVERSITY DEGREE OR DIPLOMA IN TECHNOLOGY
Analysis by age and income group

	Age groups											Age not stated	
	Under												
	25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70 and over		
TOTALS	12 863	361	1630	2184	2290	2302	1373	1047	859	622	132	33	82
ALL NON-GRADUATE ENGINEERS													
	%												
Below £1000	2.8	1.4	5	2	2	2	5	4	3	5	3	1	2
£1000-1199	5.1	4.9	97	368	84	25	6	3	9	13	3	1	2
£1200-1399	13.7	10.9	32	579	442	132	71	22	29	23	7	4	3
£1400-1599	17.0	13.6	8	371	599	345	159	55	48	38	10	2	7
£1600-1799	18.7	14.9	4	147	497	578	351	141	86	71	37	10	10
£1800-1999	14.7	11.5	2	49	264	381	254	176	113	62	49	8	9
£2000-2499	27.3	21.9	—	28	225	600	792	481	202	224	136	15	16
£2500-2999	11.5	9.7	1	2	40	167	304	228	105	131	91	16	3
£3000-3499	8.1	6.6	1	1	10	71	172	140	171	138	89	12	1
£4000-4999	3.0	2.4	—	—	4	14	43	49	65	65	53	12	2
£5000-5999	1.4	1.1	—	—	1	4	26	22	28	31	20	8	1
£6000 and over	1.7	1.4	—	1	1	5	17	29	30	28	39	15	4
Income not stated	2.8	1.6	30	32	44	33	29	22	19	29	12	9	7
Lower decile	1250	£	£	£	£	£	£	£	£	£	£	£	*
Lower quartile	1508	902	1188	1402	1623	1781	1910	1963	1961	1832	1691	1691	*
Median	1868	1005	1331	1582	1855	2086	2243	2362	2455	2454	2629	2629	*
Upper quartile	2363	1152	1507	1795	2173	2503	2749	3065	3258	3391	4267	4267	*
Upper decile	3159	£	£	£	£	£	£	£	£	£	£	£	*

*Numbers in these groups are too small to justify calculation of deciles.

Table 15

ENGINEERS IN SAMPLE WHO STATED LEVEL OF RESPONSIBILITY

Analysis by age and level

	Age groups											Age not stated	
	TOTALS	Under 25											
		25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70 and over		
ALL ENGINEERS ⁽¹⁾	17 787	536	2769	2834	2989	3123	1749	1430	1128	820	185	37	105
Analysis by level	%	9.0	15.7	16.6	16.9	17.7	9.9	8.0	6.4	4.6	1.0	0.2	
A	386	83	102	61	41	17	19	14	23	20	2	1	2
B	1 235	219	522	204	109	61	41	33	13	21	6	—	7
C	8 577	215	1628	1317	867	637	300	240	177	148	38	6	18
D	4 589	29 8	11	412	909	1021	937	507	331	242	159	9	25
E	3 971	22 3	8	98	368	778	1652	555	459	356	225	41	5
F	1 553	8 7	2	7	68	147	338	244	263	237	177	40	7
Beyond F	487	2 7	—	2	14	26	83	83	81	72	24	5	7

⁽¹⁾ Teachers were not asked to answer this question.

Table 18

ENGINEERS IN SAMPLE WHO STATED LEVEL OF RESPONSIBILITY

Percentage analysis by age and level

Age groups												
	TOTALS	Under 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70 and over
ALL ENGINEERS	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Analysis by level												
A	2.2	15.5	3.7	2.1	1.4	0.5	1.1	1.0	2.9	2.4	1.1	2.7
B	6.9	40.9	19.9	7.0	3.6	2.0	2.3	2.3	1.2	2.6	2.7	—
C	31.3	40.1	59.7	44.9	28.7	20.4	17.2	16.9	15.7	17.8	20.6	16.2
D	25.8	2.1	14.8	30.9	34.2	30.0	29.0	23.2	21.6	19.4	16.7	24.3
E	23.3	1.1	3.5	12.5	26.0	33.7	31.7	32.3	31.6	27.4	22.2	24.3
F	8.7	0.4	0.3	2.2	4.9	10.8	14.0	18.5	21.0	21.6	24.9	18.9
Beyond F	2.7	—	0.1	0.6	1.2	2.7	4.7	5.6	7.2	8.8	13.0	12.5
ALL ENGINEERS	100.0	3.0	15.7	16.6	16.9	17.7	9.9	8.9	6.4	4.6	1.0	0.2
Analysis by level												
A	100.0	21.7	26.6	15.9	10.7	4.4	5.0	3.7	6.0	5.2	0.6	0.3
B	100.0	17.8	42.5	16.6	8.9	5.0	3.3	2.7	1.1	1.7	0.4	—
C	100.0	3.9	29.2	23.7	15.4	11.6	8.4	4.9	3.2	2.6	0.7	0.1
D	100.0	0.2	9.0	19.9	22.4	20.5	11.1	7.3	5.3	3.5	0.6	0.2
E	100.0	0.2	2.5	9.3	19.7	26.7	14.1	11.6	9.0	5.7	1.0	0.2
F	100.0	0.1	0.5	4.3	8.6	22.0	16.9	17.1	15.4	11.5	3.0	0.5
Beyond F	100.0	—	0.4	2.8	7.5	17.3	17.9	16.7	16.9	15.0	5.0	1.0

Comperison with date on the incomes of corporete members collected by the Engineers' Guild

The following table and charts have been prepared to provide a link with the data from the two earlier surveys of professional engineers' incomes carried out by the Engineers' Guild in respect of the financial years 1959/60 and 1962/63.

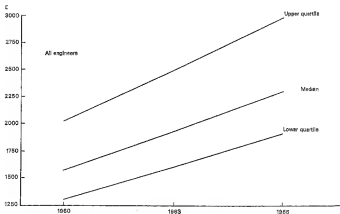
These earlier surveys covered the corporate members of four institutions only. This is a much more limited coverage than that of the present survey, and the median and quartile

incomes for 1965/66 shown below have been specially calculated to make comparison possible with the earlier surveys. The increase per annum, at the median salary, for all engineers was 6.6 per cent over the six years 1959/60 to 1965/66. For civil engineers the increase was 7.0 per cent, mechanical engineers 6.2 per cent, electrical engineers 7.2 per cent and chemical engineers 3.9 per cent.

Table 17

MEDIAN AND QUARTILE INCOMES OF CORPORATE MEMBERS (1959/60 to 1965/66)

	All engineers	Civil engineers	Mechanical engineers	Electrical engineers	Chemical engineers
Lower quartile					
1959/60	1304	1288	1302	1312	1737
1962/63	1604	1594	1669	1641	1774
1965/66	1822	1611	1833	2019	2121
Median					
1959/60	1674	1515	1567	1584	2176
1962/63	1937	1825	1903	1960	2206
1965/66	2308	2286	2248	2404	2729
Upper quartile					
1959/60	2042	1968	1984	2067	3067
1962/63	2495	2371	2486	2447	3180
1965/66	2966	2860	2875	2896	3650



How the survey was conducted

The professional institutions listed at Table 18 were asked for the number of their members in the categories of corporate member and graduate member (if appropriate). The aggregate reported, which included some duplication between institutions, amounted to about 167 000 of which 116 000 were corporate members and 51 000 were graduate members; these figures are lower than those shown in Table 18, which refer to a later date. Both sets of figures exclude overseas members and are confined to members with addresses in the United Kingdom.

The sample

The detailed information needed from the survey required a large sample of the order of 26 000 members. The distribution of the sample among the institutions was made in proportion to membership numbers, so that the sample was directly representative of the whole profession.

Envelopes for use in the survey were addressed by the institutions from their membership lists. The formula used was 'Start at the xth name and take every sixth thereafter throughout the lists of corporate and graduate members'. The starting point, *x*, was taken for each institution from a table of random numbers. Since some engineers are members of more than one institution, the same man can be drawn in more than one list. Names and addresses were therefore scrutinized in an attempt to eliminate such duplication. The sub-samples were then adjusted to the required numbers by removing names on a random basis. The final sample was 26 014.

Pilot survey

A small-scale pilot survey was made with a draft questionnaire to discover unforeseen difficulties, ambiguities, and so on.

Questionnaires used in analysis

The number of blank questionnaires returned and those to which no reply was received amounted to 3422, or 13.7 per cent of the sample. The response rate was 86 per cent. 2164 of the returned questionnaires had to be rejected—those from overseas engineers who had not been excluded at the addressing stage (they might still have been using home addresses, or they might have gone overseas since the envelopes were addressed), students and trainees, retired engineers, and so on. Replies from semi-retired engineers were retained, although their answers to the question about incomes were always discarded. This left 19 428 questionnaires to be analyzed.

The questionnaires were despatched on 23rd May 1966. The bulk of the replies were received by the end of September, and the survey was finally closed in January 1967.

FOREWORD by the Chairman of the Council of Engineering Institutions,
Sir Robert Wynne-Edwards, C.B.E., D.S.O., M.C., M.A., M.I.C.E.

SURVEY OF PROFESSIONAL ENGINEERING MANPOWER

The engineering profession plays and must continue to play a vital part in the well-being and progress of this country. It is therefore surprising that there should be a marked lack of information about it. At some points there are complete gaps in our knowledge; at others the information we have is incomplete; and at others it is not sufficiently detailed or precise. The purpose of this Survey is to help remedy these deficiencies.

The information will be invaluable in helping to plan for the future by providing pointers towards better usage of engineering talent. Every single reply to this questionnaire is therefore important; the reliability of the results depends upon the proportion of completed questionnaires returned. We trust, therefore, that you will co-operate by answering the questions and returning your completed questionnaire as soon as possible in the envelope provided.

We have taken precautions to preserve anonymity, and the identity of respondents will not be disclosed in any circumstances.

ANONYMITY

A note by the Consultant in charge of the Survey

In order to send out reminders to those who have not returned their questionnaires, I must have some means of identifying those who reply. This is the purpose of the serial numbers on the front of questionnaires. I must make sure that this number is used only in removing from the reminder file the names of those who have replied, and that it is not used to connect answers (particularly the one concerning income) with the individual who supplied them. The following is the procedure which I have adopted.

The only occasion when a questionnaire and the name of the person who completed it might come together is when the name is being removed from the reminder file. So this process will always be carried out by two people: one will have the questionnaires and will call out numbers to the other, who will remove the corresponding names from the file. The one who has the questionnaires will not see the names, and the one who sees the names will not have the questionnaires.

I will keep the removed names under lock and key until they can be destroyed. Then there will be no record anywhere of the names of people who have returned questionnaires. By the time the questionnaires are opened for analysis of replies, they will be completely anonymous.

Returned questionnaires must be handled by my staff and by the data-processing organization, but no one in the CEI or the Professional Institutions or the Ministry will have access to any questionnaires.

These precautions seem adequate to me, but if you are not convinced, then by cutting from the front page of the questionnaire the corner with the number on it, you will remove the only means by which you can be identified. But if you do this your name will, of course, remain in the reminder file, and you must not be annoyed with me when you receive reminders.

CHRISTOPHER SCARBOROUGH

SURVEY OF PROFESSIONAL ENGINEERING MANPOWER

This questionnaire is being sent to a sample of the members of the Professional Engineering Institutions. If you are a member of more than one of these Institutions it is possible that you will receive more than one copy of this questionnaire. Should that happen, please complete one of them, mark the other (or others) 'Duplicate', and return them together in one of the envelopes provided.

Most of the numbers can be answered by ringing one of a series of numbers. These numbers are purely an aid to analysis and have no other significance.

PART I GENERAL

- Please indicate by ringing the appropriate number or numbers below whether you are a Member, an Associate Member or a Graduate Member of any of the Institutions listed.

												Member	Associate Member	Graduate Member
The Royal Aeronautical Society	..	..	..	..	..	..	..	..	..	..	..	1	1	1
The Institution of Chemical Engineers	..	..	..	..	..	..	..	..	..	..	..	2	2	2
The Institution of Civil Engineers	..	..	..	..	..	..	..	..	..	..	..	3	3	3
The Institution of Electrical Engineers	..	..	..	..	..	..	..	..	..	..	..	4	4	4
The Institution of Electronic and Radio Engineers	..	..	..	..	..	..	..	..	..	..	..	5	5	5
The Institution of Gas Engineers	..	..	..	..	..	..	..	..	..	..	..	6	6	6
The Institute of Marine Engineers	..	..	..	..	..	..	..	..	..	..	..	7	7	7
The Institution of Mechanical Engineers	..	..	..	..	..	..	..	..	..	..	..	8	8	8
The Institution of Mining and Metallurgy	..	..	..	..	..	..	..	..	..	..	..	9	9	9
The Institution of Mining Engineers	..	..	..	..	..	..	..	..	..	..	..	10	10	10
The Institution of Municipal Engineers	..	..	..	..	..	..	..	..	..	..	..	11	11	11
The Royal Institution of Naval Architects	..	..	..	..	..	..	..	..	..	..	..	12	12	12
The Institution of Production Engineers	..	..	..	..	..	..	..	..	..	..	..	13	13	13
The Institution of Structural Engineers	..	..	..	..	..	..	..	..	..	..	..	14	14	14

- Please underline the year in which you were born in the table below.

1942 or later	1941 1940 1939 1938 1937	1936 1935 1934 1933 1932	1931 1930 1929 1928 1927	1926 1925 1924 1923 1922	1921 1920 1919 1918 1917	1916 1915 1914 1913 1912	1911 1910 1909 1908 1907	1906 1905 1904 1903 1902	1901 1900 1899 1898 1897	1896 or earlier
1	2	3	4	5	6	7	8	9	10	11

The 'financial year' referred to in the three questions which follow is the year ended on 5 April 1966.

- If you were retired or partially retired during the financial year 1965/66, please ring the appropriate number below, and return this questionnaire in the envelope provided.

Retired	..	..	..	..	..	..	..	..	..	1
Partially retired	..	..	..	..	..	..	..	..	..	2

- If you were not working continuously throughout the financial year 1965/66 (for example because of illness or unemployment) to an extent that seriously affected your income for the year, please ring the number 1 below, and answer the remaining questions except Question 13, which asks for your income.

Income seriously affected	1
---------------------------	----	----	----	----	----	----	----	----	----	---

5. If you were working outside the United Kingdom (see note below) during all or part of the financial year 1965/66 (other than attending conferences or paying visits in connection with your work), please ring the number 1 below, and write in how much time you spent abroad during the year.

Worked abroad 1

Time abroad during year.....

'Working outside the United Kingdom' means being in more or less regular employment or in practice during the year in another country. If you were employed by a firm in the U.K. but were working overseas, this question will apply to you if you were paid an overseas salary; but it will not apply if you remained on your U.K. salary with or without special expense allowances.

The United Kingdom is England, Scotland, Wales and Northern Ireland, but not the Irish Republic.

PART II QUALIFICATIONS AND TRAINING

- 6A. Please list below your professional qualifications (certificates, diplomas, degrees, etc.)

.....

- 6a. If you have a university degree (B.Eng., B.Sc., M.A. etc.) in Engineering or Science, or if you hold the Diploma in Technology (Dip.Tech.), please ring the appropriate number below and write in your branch or subject.

If you have more than one degree, please answer for your first degree in Engineering or Science.

First degree in Engineering	1
Branch or subject.....1A	
First degree in Science	2
Subject.....2A	
The Diploma in Technology in Engineering	3
Branch or subject.....3A	
The Diploma in Technology in Science	4
Subject.....4A	

7. Please indicate with whom you did your professional or practical training by ringing the appropriate number (or numbers) below.

A manufacturing concern	1
A Government department	2
The Armed Forces	3
The UK Atomic Energy Authority	4
A nationalised industry or public utility	5
A consultant or firm of consultants	6
A contractor	7
A local authority	8
Other (please specify)	9
No professional or practical training	10

PART III EMPLOYMENT

8. If in your main employment you are self-employed, please ring the number 1 here 1

The rest of the questions in this Part have two sets of numbers side by side. The first set is for answers concerning your present main employment: please ring only one *Main* number. The second set of numbers is for any secondary occupation or occupations you may have (for example lecturing), and more than one number may be ringed in this secondary set.

9. If you are a salaried employee, please indicate by ringing the appropriate number the category into which your employer falls.

	<i>Main</i>	<i>Secondary</i>
Central Government (other than the Armed Forces and the GPO)	1	1
The Armed Forces	2	2
The GPO	3	3
Local authority, including technical or training colleges and schools which are under a local authority	4	4
Nationalized industry (but not UKAEA) or public corporation (for example, BBC, NPA etc.)	5	5
The UK Atomic Energy Authority	6	6
University or college of advanced technology	7	7
Industrial or commercial company, or private firm (e.g. a firm of consultants) ..	8	8
Any other employer (please specify)	9	9

10. This question is concerned with the type of work in which you are engaged, and provision is made for recording both main and secondary occupations. If more than one of the classifications given below fits your main work, please tick only one of them—the one which is most important in your work.

If you are in an administrative or managerial position in your main occupation, please answer both Sections A and B below.

If you are not in an administrative or managerial position in your main occupation, please leave Section A blank and pass to Section B.

SECTION A

If you hold your administrative or managerial position because you are an engineer, you will fall into category a below; but if you hold your position not because you are an engineer, you will fall into category b. Please ring the appropriate number or numbers, and then answer also Section B.

	<i>Main</i>	<i>Secondary</i>
a. Administrative or managerial, as an engineer	1	1
b. Administrative or managerial, not as an engineer	2	2

SECTION B

Please ring the numbers below corresponding to the type of work in which you are engaged in your main occupation and in any secondary occupation or occupations. If, for your main occupation, more than one type of work is appropriate, please ring only one number—the one which is the most important.

	<i>Main</i>	<i>Secondary</i>
General technical administration	3	3
Production	4	4
Instrumentation and control	5	5
Construction, installation	6	6
Research and development (but not if part of a teaching appointment) ..	7	7
Design	8	8
Teaching	9	9
If your teaching involves research as well, please state the percentage of your time spent on research. %		
Commercial	9A	9A
Consultancy not covered in one of the categories above	10	10
Other engineering	11	11
Not engineering occupation, unless covered by b above	12	12
	13	13

The last category (Not engineering occupation) is for any occupation outside the engineering profession—for example, teaching non-engineering subjects.

The two previous questions have dealt with your employer and with the type of work you are doing. The next question deals with where you are now working—with your **FIELD OF WORK**.

The list provided has been worked out with care, but also with the realization that in a profession as varied as engineering no list can be entirely satisfactory. The appropriate classification for some engineers may not be easy to decide, but the examples given here may help.

So if you cannot find an exact fit for your field (or fields) of work, please choose the one that comes nearest to it and ring the corresponding number (or numbers), but please do not ring more than one number in the **Main** column.

EXAMPLES

An engineer concerned with instrumentation and control in, say, a chemical plant should ring 2—'In chemical or allied manufacture'.

A Borough Engineer or County Surveyor etc. should ring 19—'In municipal engineering'.

A ship's engineer should ring 17—'In transport (by rail, road, air, water)'.

An engineer in the research laboratory of, say, an aero-engine factory should ring 10—'In aircraft or aero-engine manufacture', not 21. But a Civil Service engineer working in a Government research Institution or Station should ring 21—'In a research institution, association or station', and not 25—'In central government administration'.

A consultant or a partner in a firm of consultants or an engineer employed by a consultant should ring 27—'In a consulting firm' even though his actual work now is in the factory etc. of a client.

An engineer employed by, say, a firm of civil engineers or a contractor, and now engaged in contract work for, say, a Gas Board should ring 13—'In construction (building, civil engineering contracting)' and not 14—'In gas production or distribution'.

11. Please ring the appropriate number below for where you are working now. Please do not ring more than one *Main* classification—the one which best fits your work.

	<i>Main</i>	<i>Secondary</i>
In mining or quarrying	1	1
In chemical or allied manufacture	2	2
In metal manufacture	3	3
In machine tools manufacture	4	4
In industrial plant or steelwork manufacture	5	5
In other mechanical engineering	6	6
 In electrical machinery or equipment manufacture	 7	 7
In electronic or telecommunications apparatus manufacture	8	8
 In shipbuilding or marine engineering	 9	 9
In aircraft or aero-engine manufacture	10	10
In vehicle manufacture	11	11
In other manufacturing industry	12	12
 In construction (building, civil engineering contracting)	 13	 13
 In gas production or distribution	 14	 14
In electricity generating or distribution	15	15
In water supply	16	16
 In transport (by rail, road, air, water)	 17	 17
In docks, harbours, inland waterways	18	18
In municipal engineering	19	19
In postal services, telecommunications or broadcasting	20	20
 In a research institution, association or station	 21	 21
In a university or college of advanced technology	22	22
In a technical college or training college	23	23
In a school	24	24
In Central Government administration	25	25
In the Armed Forces	26	26
In a consulting firm	27	27
Other work (please specify)	28	28

12. Do not answer this question if you are in an educational institution, in central or local government, or in the Armed Forces.

Please indicate by ringing the appropriate number below, the number of employees (including the partners or directors of a firm or company)—

in the column headed A, in the 'works', site or other place of work in which you are employed now;
in the column headed B, the total number in the company, firm or organisation by which you are employed now.

	A 'Works', site etc.	B Total
9 or fewer	1	1
10 to 49	2	2
50 to 99	3	3
100 to 199	4	4
200 to 499	5	5
500 to 999	6	6
1000 to 1999	7	7
2000 or more	8	8

PART IV INCOME

13. Please enter here your gross earned income for the financial year 1965/66. (See notes below for the figure which is required.)

Income from main occupation £.....
Income from secondary occupation (if any) £.....

The income required here is your gross income as returned for Income Tax for the year 1965/66 but excluding any unearned income and wife's income.

FOR SALARIED EMPLOYEES it is the total amount paid to you by your employer (or employers if you have a secondary engineering occupation as well as your main one). This income is shown on the tax form P60 which your employer will have given to you or will give you if you ask for it.

FOR SELF-EMPLOYED ENGINEERS it is your income for the financial year 1965/66 less expenses etc. allowed for Income Tax, but before the deduction of personal or capital or other allowances. Please note that it is not the amount on which you paid tax in 1965/66, which is your income for the previous year.

If your financial year ends at a date other than April 5, please give your income for your own financial year which ended at a date between 6 April 1965 and 5 April 1966.

PART V LEVELS OF RESPONSIBILITY

The previous questions have all been concerned with matters of fact. In this Part we are concerned with a matter of judgement.

A pilot run on a small scale with this question indicates that most engineers will find it not too difficult to fit themselves into one or other of these levels, except for university and other teachers, for whom these levels are not suitable. If, therefore, you are a teacher please leave this question unanswered.

The table opposite* has been drawn up as a guide to six levels of responsibility, and it is intended as a guide, not as a precise definition.

No guide can hope to fit exactly over the wide range of activities of the various kinds of professional engineering, so using the guide is a matter of deciding which level, taken as a whole, is the best fit for you.

You may possibly find yourself fitting different levels for the various divisions of the table. It is then a matter of judgement to decide which level comes nearest to fitting your work.

It is obviously important that you should read the descriptions of all the levels before making your decision.

When you have decided, please ring the appropriate number below.

Level A	1
Level B	2
Level C	3
Level D	4
Level E	5
Level F	6
Beyond Level F	7



* The guide to the six levels of responsibility is shown on pages 14 and 15 of this Report.

The Survey of Professional Engineers 1966

**Ministry of Technology
and the Council of Engineering Institutions**



**London, 1967
Her Majesty's Stationery Office**

Steering Committee on the Survey of Professional Engineers 1966

Membership

Ministry of Technology

Mr S W Spels (Chairman)

Council of Engineering Institutions

Mr E S Sellers

Professor C Barnard

Mr B Hildrew

Brigadier J R G Finch

Mr L Wild

Ministry of Technology

Mrs J G Cox

Mr K W Haines

Mr G B Roberts (Secretary)

Preface

This report presents the first results of the most comprehensive survey yet carried out of the qualifications, fields of activity, responsibilities and income of the professional engineer in Britain. The survey itself was a joint venture planned between the Ministry of Technology and the Council of Engineering Institutions together with the co-operation of the professional engineering institutions and the Engineers' Guild. The conduct of the survey was entrusted to a consultant, Mr. Christopher Scarborough, who achieved a high level of response from the professional engineers themselves. The selection and presentation of the results for this first publication were undertaken by a Steering Committee drawn from the Council of Engineering Institutions and the Ministry of Technology, with a membership as listed opposite. The Committee is indebted to the Committee on Manpower Resources for Science and Technology and particularly for the personal contribution of their chairman, Lord Jackson of Burnley, who took an interest in the survey throughout and made many valuable suggestions.

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